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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/646,387 | 08/22/2003 | Mingjing Li | MS1-1628US | 9732 |
| 22801 | 7590 | 01/26/2007 | | |
| LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201 | | | EXAMINER PATEL, KANJIBHAI B | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2624 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | NOTIFICATION DATE | DELIVERY MODE | |
| 3 MONTHS | | 01/26/2007 | ELECTRONIC | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/26/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lhptoms@leehayes.com

Office Action Summary

Application No.

10/646,387

Applicant(s)

LI ET AL.

Examiner

Kanji Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-100 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 15-18, 34-38, 40, 48-51, 67-71, 73, 81-84 and 100 is/are rejected.
- 7) ☒ Claim(s) 6, 8-14, 19-33, 39, 41-47, 52-66, 72, 74-80 and 85-99 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/22/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892).
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because of the following informalities:

(1) Figures 1, 3, 6-7, 9, 10 contain a black straight line which is not supposed to be there.

(2) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **Reference No. 300 is not shown in Figure 3.**

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7, 34-38, 40, 67-71, 73 and 100 are rejected under 35 U.S.C. 102

(e) as being anticipated by LaRossa et al. (US 6,611,627 B1).

For claims 1, 34 and 67, LaRossa et al. disclose a method comprising:

accessing at least a portion of a digital image (input image in Figure 1; column 4, lines 42-46); and

determining if at least said portion is blurred (column 5, lines 45-50) based on a wavelet transform blur detection process (column 4, lines 42-58; column 5, lines 41-65; input image $B_0(x, y)$ 22 is convolved 24 with smoothing filter $S_x S_y$ 26 to produce a once blurred version of the input image, $B_i(x, y)$ 28 as shown in Figure 3).

For claims 2, 35 and 68, LaRossa et al. disclose the method, wherein said wavelet transform blur detection process includes:

wavelet transforming at least said portion of said digital image to produce a plurality of corresponding different resolution levels, each resolution level including a

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plurality of bands (column 4, lines 42-51; plurality of bands for each level of resolution is inherent in deriving wavelet transform coefficients);

generating at least one edge map for each of said resolution levels (column 4, lines 32-41; Figure 1, step 12; 70 in Figure 5); and

detecting blur in at least said portion of said digital image based on said resulting edge maps (column 4, lines 42-58).

For claims 3, 36 and 69, LaRossa et al. disclose the method, wherein detecting blur in at least said portion of said digital image based on said resulting edge maps further includes normalizing each of said resulting edge maps (column 5, lines 9-15).

For claims 4, 37 and 70, LaRossa et al. disclose the method, wherein normalizing each of said resulting edge maps further includes discretizing edge information (block 72 in Figure 5).

For claims 5, 38 and 71, LaRossa et al. disclose the method, wherein said edge information includes edge amplitude data (column 4, lines 42-58).

For claims 7, 40 and 73, LaRossa et al. disclose the method, wherein said plurality of bands includes at least LL, HL, LH, HH bands (column 4, lines 42-51; various resolutions includes all the bands inherently).

For claim 100, LaRossa et al. disclose the apparatus, wherein said apparatus includes at least one device selected from a group of devices comprising a computer, a camera, a set top box, an optical disc player, an optical disc player recorder, a portable communication device, a display device, a television set, and a projector (column 1, lines 7-14).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 34 and 67 are rejected under 35 U.S.C. 102 (b) as being anticipated by S. Obata et al. (Image Restoration using Plural Blurred Images by means of Multi-Resolution Analysis, pages 259-263, IEEE—1997).

For claims 1, 34 and 67, S. Obata et al. disclose a method comprising:

accessing at least a portion of a digital image (paragraphs 4-5) ; and
determining if at least said portion is blurred based on a wavelet transform blur detection process (paragraphs 1, 5; Figure 6 provides a blur removed clean image).

4. **Claims 1,15-17, 34, 48-50, 67 and 81-83** are rejected under 35 U.S.C. 102 (b) as being anticipated by Manfred R. Schroeder (US 3,627,920).

For claims 1, 34 and 67, Manfred R. Schroeder discloses a method comprising:

accessing at least a portion of a digital image (column 4, lines 7-20); and
determining if at least said portion is blurred based on a Cestrum analysis blur detection process (analyzer 16 in Figure 1 employs a spectrum analyzer 17, a logarithmic amplifier 18 and a second spectrum analyzer 19 for cepstrum analysis; see for detailed explanation at column 4 line 21 to column 4 line 58).

For claims 15, 48 and 81, Manfred R. Schroeder discloses the method wherein said Cepstrum analysis blur detection process includes:

$c(f) = \text{real}(\text{FFT}^{-1}(\log(\text{IFFT}(|I|))))$ (column 4, lines 39-65).

For claims 16, 49 and 82, Manfred R. Schroeder discloses the method, wherein said Cepstrum analysis blur detection process includes:

dividing said image into a plurality of parts (column 5, lines 5-29); and

determining a Cepstrum for each of said parts (column 5, lines 30-58).

For claims 17, 50 and 83, Manfred R. Schroeder discloses the method, wherein said Cepstrum analysis blur detection process includes: blurring at least one boundary within said image (column 5, lines 5-29).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18, 51 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manfred R. Schroeder (US 3,627,920) as applied to claims 1, 34 and 67 above and further in view of Michael Chang et al. (Blur Identification Using the Bispectrum, pages 2323-2325, IEEE 1991).

For claims 18, 51 and 84, Manfred R. Schroeder does not clearly disclose the use of point spread function as claimed in the invention. However, Michael Chang et al. discloses that a blur identification, which refers to the estimation of the point spread function (PSF) of the blur, is the first and the most important step towards the restoration of images. (see paragraph 1 of introduction and also paragraph II of theory). Both references are combinable because they both deal with the same problem of blur identification and restoration of images. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the use of the point spread function (PSF) into the method of Manfred R. Schroeder as taught by Michael Chang et al. Doing so will eliminate additive, signal-independent, and Gaussian observation noise.

Allowable Subject Matter

6. **Claims 6, 8-14, 19-33, 39, 41-47, 52-66, 72, 74-80 and 85-99** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other prior art cited

7. The prior art made on record and not relied upon is considered pertinent to applicant's disclosure.

Zhang et al. (US 6,381,035 B1) disclose an edge compaction in antialiased images.

Basu et al. (US 6,253,175 B1) disclose a wavelet-based energy binning cepstral features for automatic speech recognition.

Bradley et al. (US 7,054,507 B1) disclose a method of kernel selection for image interpolation.

Labaere et al. (US 5,717,791) disclose an image contrast enhancing method.

Nagao (US 6,628,842 B1) discloses an image processing method and apparatus.

Saunders et al. (US 6,825,780 B2) disclose a multiple codec-imager system and method.

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Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kanji Patel whose telephone number is (571) 272-7454.

The examiner can normally be reached on Monday to Thursday from 8 a.m. to 6:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lillis Eileen can be reached on (571) 272-6928 The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kanji Patel
Art Unit 2624
1/19/07


KANJIBHAI PATEL
PRIMARY EXAMINER